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ABSTRACT

Computer mapping is part of the larger field of computer graphics and is an extremely important development in cartography. It is not, however, synonymous with automated cartography. Computer mapping involves the synthesis of a base map of an area with selected information about that area. The result is a series of maps that give a geographical representation of the information involved. Any information that has spatial significance can be mapped and illustrated, compared, aggregated, manipulated, and analyzed by a variety of programs. The base map has to be prepared in a conventional manner and the data collected in a similar fashion. The base map, however, need only be a sketch of the outline of the study area plus the zones or points on which data has been collected. This can be at any scale, but it has to be accurate, as the final computer map will reflect the accuracy of the initial base. This bibliography draws its material from a wide number of journals but does not claim to be comprehensive, as this is a rapidly expanding field. (Author/IRT)

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BIBLIOGRAPHY OF COMPUTER MAPPING

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The use of computers in mapping is a phenomenon of the 1960's and developments in this field in recent years have been made with dramatic rapidity. Computer mapping is part of the larger field of computer graphics and many experts in the computer field feel that the 1970's will see a great advance in the use of computer graphics which may revolutionize developments and research in fields where both two and three dimensioned spatial distribution are significant.

Computer mapping is an extremely important development in cartography and it is the opinion of this writer that the computer will make the map a much more meaningful tool than it has even been before. The 1970's will be a computer mapping decade.

Computer mapping and automated cartography are not synonomous. The principal contribution which computer mapping technology has to offer is not the replacement of the cartographer or the draughtsman with a machine. The need for the qualified cartographer in 1980 is likely to be just as great, if not greater, than in 1970. Computer maps can be produced to publication standard both in black and white and in colour but the main thrust of research developments has not been in this direction but in the direction of using the computer map as an analytical tool.

Computer mapping simply involves the synthesis of a base map of an area with selected information about that area. The result is a series of maps which give a geographical representation of the information involved. Any information which has spatial significance can be mapped. The base map has to be prepared in a conventional manner and the data collected in a similar fashion. The base map however need only be a sketch of the outline of the study area plus the zones or points on which data has been collected. This can be at any scale but it has to be accurate as the final computer map will reflect the accuracy of the initial base and the statistics related to it. The computer maxim of Garbage In = Garbage Out must be borne in mind at all times during the use of computer mapping programmes.

The area and subjects to which computer mapping can be applied cover a very wide range. Any type of data which has spatial significance can be illustrated, compared, aggregated, manipulated and analysed by a variety of programmes. Geographers, for example, have long claimed to be interested in spatial correlations; computer mapping offers a tool which will allow the discernment, description and analysis of such relationships with a much greater degree of accuracy than has ever been possible before. It also provides an exciting new method of comparing variables which are measured in unlike terms, the basis for comparison being the areal distribution of these variables. The computer map uses as a basis for comparison and correlation the spatial distribution of phenomena regardless of how these are measured and expressed; consequently such diverse variables as religious attitudes, educational levels, occupations, ethnicity, political attitudes and income levels can all be compared.

Maps have always been available as a means of comparing data, especially through the use of overlays, but only on a limited scale. The potential for such comparison by computer mapping is immense. A number of maps can be compared and a composite map showing the spatial correlation between the variables illustrated by each map produced. At present the number of variables which can be compared is not large but will be increased in the near future.

Computer mapping has already been applied in a number of areas. A recent study of Goldstein has revealed the wide use of computer mapping techniques which is being made in planning, especially in the urban context. The first computer atlas of an urban area has already appeared and similar atlases are being compiled for Birmingham, England, Jerusalem and Zurich. The technique has also been used in marketing research, recreational planning, community renewal, geology, engineering, geomagnetic research, oil and gas, and botany. In a recent study of the use of computers in geography by Tarrant it was revealed that 50 of the 151 scholars listed were using computer mapping programmes. During the 1970's both the volume and the scope of these applications are likely to increase considerably.

In addition the 1970's are likely to see many new developments in the field. Geo-coded data banks for various areas already exist and the next census in Canada, the U.S.A. and the United Kingdom will have all data collected and coded in a form which will allow computer maps to be easily constructed from them. With an increasing volume of data becoming available the map will become increasingly significant as a means of analysis and display.

In expanding urban areas the creation of spatial data banks could reduce the need to produce maps in their conventional form. Machine capabilities exist to allow a map to be constructed and displayed on a Cathode Ray Tube. A network of such tubes tied on a time sharing basis to a central computer data bank would allow the user to call for the display of any map he required. Consequently hundreds of maps could be viewed without any map being printed out. The user, if he wishes, could select the map or maps he wished to retain and have those produced on paper by an output device.

This concept could be taken even further with the creation of an electronic map of a city which is alive in that it would constantly change as data are fed into it. A traffic map for example could be constructed, automatically and instantaneously, from data collected by traffic meters at various points. The result would be a living traffic density map. Other aspects of city life such as power and water demand could be added to this until a composite map of the city was built up.

Computer mapping developments will greatly enhance the use of the map as an analytical tool in the 1970's. This may lead to a distinct change in emphasis in map use with the map no longer being dominatly used as a means of displaying information. It may also make thematic maps the most commonly produced types of map and the phrase 'special purpose mapping' may well have to be redefined.

Quantitative methods are often viewed with considerable scepticism on one hand and wild enthusiasm on the other, and to the layman some of the statistical methods used are virtually incomprehensible. The new generation of computer specialists is

already creating its own protective jargon - "hardware", "software", "bugs", "bytes", and "K", which has already gone a long way towards ensuring that few outside the profession will understand what is going on. Computer mapping is a tool which can be applied by more traditional scholars as by the new quantifiers; it is also comprehensible to the vast body of people who do not speak "computerese"; it is a tool which few can afford to ignore. This bibliography has been compiled to draw attention to the field of Computer Mapping and draws its material from a wide number of journals. It is not claimed that the bibliography is completely comprehensive as this is a rapidly expanding field.

For those interested in a general introduction to Computer Mapping, The Computer Atlas of Kenya by D.R.F. Taylor contains a twenty page introductory description.

Adler, Ron K.H., James P. Reilly, and C. R. Schwartz. "A Generalized System for the Evaluation and Automatic Plotting of Map Projections". The Canadian Surveyor, Vol. 22, No. 5, 1968, pp. 442-450.

Alexander, R., W. Bailey, M. W. Dacey, D. F. Marble and W. L. Garrison. "Data Systems Requirements for Geographic Research". Technical Report No. 1, ONR. Task 1, No. 389-142; Contract NONR 1288(35).

Alfredsson, Bjorn; Owe Salomansson; Kristo Selander. "A Spatial Information System. A Pilot Study. Introduction. C.F.D". Central Board for Real Estate Data. Development Department. Fris. A. 1 May 1970.

All-Union Conference on Automation & Mechanization in Cartography. "Computer Mapping of Cloud Photos". Perspective, Vol. 5, No. 3, 1963.

_____. "First Fully Automatic Map Making Machine". The Australian Surveyor, Vol. 20, No. 5, March, 1965, pp. 341-343.

_____. "Mapping the Earth by Computer". Business Week, October 5, 1968.

_____. Moscow, January, 1967, No. 7 of the English Language translation of Geodesy and Aerophotography.

_____. "Technical Conference: Automated Colour Separation and Digital Cartography". ACIC and RADC (Aeronautical Chart & Information Center).

Altenhofen, Robert E. "Analytical Adjustment of Horizontal Aerotriangulation". U. S. Geological Survey, March, 1966.

Anderson, Axel. "Maps and Map-Information in a New Computer System for Real Estate Data Sundbygerg, Sweden". Swedish Central Board for Real Estate Data. Mapping Department 1970.

Arda. "Feasibility Report of Computer Mapping System". Spartan Air Services Ltd., Ottawa, Canada. Project 14007 ARDA Department of Agriculture, Government of Canada.

Army Map Service. "Preliminary Investigation on Potentials of Profile Scanning of the Stereo Model". AMS Technical Development Report.

_____. "Stereo-Carving Instrument Development". AMS Final Technical Report, November 30, 1956.

Aumen, W. C. "A New Map - the Numerical Map". American Society of Cartographers, Bulletin, Vol. 2, No. 1, November, 1966.

Aumen, W. C., Raymond R. Mays, & Arthur Noma. "Digitizing Graphich Data at the Army Map Service". Corps of Engineers, U. S. Army. Army Map Service, Washington, D.C.

Automatic Cartography and Planning, by the Experimental Cartography Unit, Royal College of Art, Architectural Press, London, 1971.

Bailey, W., M. S. Dacey, D. F. Marble, W. L. Garrison & R. Alexander. "Data Systems Requirements for Geographic Research". Technical Report No. 1, ONR Task 1, No. 389-142; Contract NONR 1288(35).

Balchin, W.V.G., & A. M. Coleman. "Cartography and Computers". The Cartographer, Vol. 4, No. 2, 1967, pp. 120-127.

Barraclough, R. E., and P. Rosenberg. "AULT System for Automatic Locational Identification", based on a paper presented at the ACSM-ASP National Convention, Washington, D.C., March, 1964.

Barraclough, R. E. "Mapping and EDP", presented at the Electronic Data Processing Session of the American Society of Planning Officials Annual Meeting. Toronto, Canada, April, 1965.

Barton, B. & W. Tobler. "A Spectral Analysis of Innovation Diffusion". Geog. Analysis, April, 1971, Vol. III, No. 2, pp. 182-186.

Basham, W. L. & D. R. Ojakangas. "Simplified Computer Contouring of Exploration Data". Stanford University Publication, Geological Sciences, Vol. 9, No. 2, pp. 757-770.

Basile, Anthony S. "The Key to Automated Cartography, A Precision Digital Plotter System". United States Naval Oceanographic Office.

Beaton, Robert J. "Cartographic Uses of the Model E-51 Coordinatography System". 20th International Geographical Congress Abstracts of Papers. U. S. Oceanographic Office, Washington, D.C.

Bechtold, Carl W. "Studies in Computer Graphics". Engineering Graphics, Vol. 8, No. 9, September, 1968, pp. 18-20.

Becker, Joseph & Robert M. Hayes. Information Storage and Retrieval Tools Elements Theories. John Wiley & Sons, New York, New York, 1963.

Bengtsson, Bengt-Erik & Stig Nordbeck. "Construction of Isarithms and Isarithmic Maps by Computers". University of Lund, Sweden, BIT 4 87-105 (1964).

Berkeley, Edmund C. The Computer Revolution. Doubleday & Co., Garden City, New York, 1962.

Berry, Brian J.L., Richard L. Merrill, & Waldo R. Tobler. "Geographical Ordering of Information - New Opportunities", The Professional Geographer, Vol. 16, No. 4, July, 1964, pp. 39-44.

Bertin, Jacques. "Cartographie Statistique Automatique". Comité Francais de Cartographie, Bulletin, FASC No. 33. Août - September, 1967, pp. 248-252.

Bickmore, David. "Automation in der Kartographie". Kartographische Nachrichten 19. Jahrgarg. Heft 5. Okt. 1969, pp. 180-185.

Bickmore, David (ed). "Automatic Cartography" on behalf of the Experimental Cartography Unit, Royal College of Art. Architecture Press, 1970.

Bickmore, David. "Computers and Geology". The Geographical Magazine, Vol. XLII, No. 1, October, 1969, pp. 43-44.

Bickmore, D. P. "The Oxford Cartographica Data Bank". Report of Proceedings, Conference of Commonwealth Survey Officers, 1967, (H.M.S.O.) Chapt. 11, Cartography II, pp. 565-573.

Bickmore, O. P.[1] and A. R. Boyle[2]. "An Automatic System of Cartography". 20th International Geographical Congress 1964, Abstracts of Papers. F. E. Ian Hamilton, Ed. Thomas Nelson and Sons Ltd., London, 1964.

[1]Clarendon Press, Oxford, England.

[2]Dobbie McInnes (Electronics) Ltd., Glasgow, Scotland.

Bickmore, D. P., & A. R. Boyle. "Fully Automated Electronic Group of Machines for Cartographic Purposes". International Year Book of Cartography, Vol. 5, 1965, pp. 24-29.

Bishop, K. H., & S. C. Gibson. Mapping by 1401 Computer Using Map 01, Department of Public Works, Albany, New York, March, 1966.

Boehm, B. W. "Tabular Representations of Multivariate Functions - with Applications to Topographic Modeling". Rand Corp. Mono. RM-4636-PR, February, 1967, 80 pp. 26 refs.

Bond, D. H., & K. D. McGlasham. "A Method of Using Computer Assistance in Mapping Geographical Synoptic Data". Die Erde, Vol. 98, No. 4, 1967, pp. 292-297.

Boyce, D. E., L. A. Goldfarb, & E. W. Veitch. Prospectus for a Computer System for Urban Mapping, Institute for Environmental Studies, University of Pennsylvania, and Pennsylvania Research Associates, Philadelphia, Pennsylvania.

Boyce, Ronald R. The Conference on Recent Advances of Computer Methods in Geographical Research at Northwestern University. August 19-30, 1963, pp. 1-4.

Boyle, A. R. & D. P. Bickmore. "An Automatic System of Cartography". 20th International Geographical Congress 1964, Abstracts of Papers. F. E. Ian Hamilton, Ed., Thomas Nelson & Sons Ltd., London, 1964.

_____. "Fully Automated Electronic Group of Machines for Cartography Purposes". International Year Book of Cartography, Vol. 5, 1965, pp. 24-29.

Boyle, A. R. Interim Report, Automatic Cartography Description of C.H.S. System, University of Saskatchewan, Canada, January, 1970.

Brooks, William D., & Kenneth G. Pinzke. "A Computer Program for Three-Dimensional Presentation of Geographical Data". The Canadian Cartographer. Vol. 8, December, 1971, No. 2, pp. 110-125.

Brounstein, S. H. "Some Concepts and Techniques for Constructing and Using a Geographically-Oriented Urban Data Base", Socio-Economic Planning Sciences, vol. 1, No. 3, July, 1968.

Brown, A. E. "Matrix Methods for Terrain Profile Simulation (Project CATVAR)", Cornell Aeronautical Laboratory, Inc., Buffalo, 1963. CAL Report No. VT-1810-G-1.

Brunton, G. D., H. C. Lee, M. A. Rosenfeld, I. H. Gram, Jr., & H. A. Slack. "Now - Map Making Made Accurate, Objective". Oil and Gas Journal, Vol. 61, No. 31, August 5, 1963, pp. 158-170.

Cahn, L., R. T. Moore, & M. C. Stark. "Digitizing Pictoral Information with a Precision Optical Scanner". Photogrammetric Engineering, Vol. 30, No. 6, November, 1964, pp. 923-931.

Cain, J. C. & J. R. Neilon. "Automatic Mapping of the Geomagnetic Field". Journal of Geophysical Research, Vol. 68, No. 16, August, 1963, pp. 4689-4696.

"CALFORM". A program that produces conformant maps on a pen plotter using symbolism to represent data values associated with geographic areas--brief description of the program with technical specifications and order form.

Calkins, H. W. Operations Manual for Street Address Conversion System, Research Report No. 2, Urban Data Centre, University of Washington, 1965.

Calkins, H. W. "Ottawa Street Address Conversion System", in Highway Research Record, No. 194, pp. 96-102, 1967.

Callander, J., J. Diello, & K. Kirk. "The Development of an Automated Cartographic System", The Cartographic Journal, Vol. 6, No. 2, June, 1969, pp. 9-17.

Cameron, S. H., D. Ewing, & M. Liveright. DIALOG: A Conversational Programming System With a Graphical Orientation, IITI Technical Note No. 109, Chicago, September, 1966.

Carroll, J. Douglas Jr., & Garred P. Jones. "Interpretation of Desire Line Charts Made on a Cartographatron". Chicago: Chicago Area Transportation Study, January, 1960, 33 pp. Also in Highway Reserve Board Bulletin, No. 86, 1960, p. 108.

Carroll, J. Douglas, & G. P. Jones. "The Cartophotron". Traffic Engineering, No. 7, 1960, pp. 18-25.

Cartwright, R. S. Calform Users Manual, Harvard University, Cambridge, 1970.

Cerny, J. W. "A Computer Program for Azimuthal Map Transformations". The Professional Geographer, Vol. 23, No. 2, April, 1971, pp. 144/145.

Choha, Deforest D., & Robert C. Stirling. "An Automatic Digital System for Preparing Graphics". U. S. N.O.O. (U. S. Naval Oceanographic Office).

Chorley, R. J., & P. Haggett. "Trend-Surface Mapping in Geographical Research". Institute of British Geographers Transactions, Trans. No. 37. 1965, pp. 47-67.

Christensen, Philip. "Quantitative Mapping - A Bibliography". April, 1968.

Christensen, R. L., W. L. Gilman, F. D. Schulman, & J. V. Sharp. "Automatic Map Compilation Using Digital Techniques". Photogrammetric Engineering. Vol. 31, No. 2, March, 1965, pp. 223-239.

Christian Science Monitor. Article: "Computers Map Air Pollution", reprint of an April 17, 1970 article.

Cirrito, J. J. "A Carto-Data Reduction System". Professional Geographer, Vol. 14, No. 2, March, 1962, pp. 34-37.

_____. "Radar Photogrammetry - A Cartographic Process". Professional Geographer, Vol. 15, No. 1, January, 1963, pp. 21-26.

Cliff, Andrew D. "Computing the Spatial Correspondence between Geographical Patterns". TR. INS. BR. GEOG., Vol. 50, (1970), pp. 143-154.

Cobb, Michael. "Changing Map Scales by Automation: Experiment in Computerised Cartography". The Geographical Magazine. Vol. XLIII, No. 11, August, 1971, p. 786.

Coleman, Alice. "Land Use Survey - the next step". The Geographical Magazine, Vol. XLII, No. 1, October, 1969, pp. 39-42.

Coleman, A. M., & W.V.G. Balchin. "Cartography and Computers", The Cartographer, Vol. 4, No. 2, 1967, pp. 120-127.

Colner, Bernard J. "Line-Simulated Map", Surveying and Mapping, Vol. 27, No. 3, September, 1967.

_____. Commission on College Geography, Computer Assisted Instruction in Geography, Association of American Geographers, Washington, D.C., 1969.

_____. Computer Mapmaking: A User's Manual, The Technical Record, Regional Planning Council, Baltimore, Maryland.

COMPUTER MAPPING. Articles: "Computer Mapping" and "Making Maps by Computer", Current Events Newsletter, April 28, 1971.

"Confection et Utilisation Automatique des Plans de Voirs dans le Cadre d'un Banque de Données Urbains". Comite Francais de Cartographie. Bull. Fascicule No. 43, février - mars, 1970, pp. 15-24.

Conway, Daniel W. "Symap Colour Separation Test #1". Regional Planning Council, Baltimore, Maryland, 21201.

Cooke, D. F., & W. H. Maxfield. "The Development of a Geographic Base File and Its Uses for Mapping", in Urban and Regional Information Systems for Social Programs, papers from the Fifth Annual Conference of the Urban and Regional Information Systems Association, New York, September, 1967, pp. 207-218.

Coppock, J. T. "An Agricultural Atlas of Scotland", The Cartographic Journal, Vol. 6, No. 1, June, 1969, pp. 36-46.

_____. "Electronic Data Processing in Geographical Research". Professional Geographer, Vol. 14, No. 4, 1962, pp. 1-4.

Cornwell, Bruce & Arthur H. Robinson. "Possibilities for Computer Animated Films in Cartography". The Cartographic Journal, Vol. 3, No. 2, 1966, pp. 79-82.

Cottafava, G., & G. LeMoli. "Automatic Contour Map". Comm. ACM (Assoc. for Computing Machinery), Vol. 12, No. 7, July, 1969, pp. 386-391.

Craig, William J. "A Useful Computer Function to Measure Distances". The Professional Geographer, Vol. 23, No. 2, April, 1971, pp. 157-159.

Cram, I. H., Jr., H A. Slack, G. D. Brunton, H. C. Lee, & M. A. Rosenfeld. "Now-Map Making Made Accurate, Objective". Oil and Gas Journal, Vol. 61, No. 31, August 5, 1963, pp. 158-170.

Crudale, A. Robert. "The Eloquence of Maps". Engineering Graphics, October, 1969.

Cude, William C. "Automation in Mapping". Surveying and Mapping, Vol. 22, No. 3, September, 1962, pp. 413-436.

Curtiss, D. A. "Automated Drafting: Where are we now?" Graphic Science, July, 1965.

Dacey, M. F. "Linguistic Aspects of Maps and Geographic Information". Ontario Geography, No. 5, 1970, pp. 71-80.

Dacey, M. F., & D. F. Marble. "Some Comments on Certain Technical Aspects of Geographic Information Systems". Technical Report No. 2, ONR Task 1, No. 389-142; Contract NONR 1288(35).

Dacey, M. F., D. F. Marble, W. L. Garrison, R. Alexander, & W. Bailey. "Data Systems Requirements for Geographical Research". Technical Report No. 1, ONR Task 1, No. 389-142; Contract NONR 1288(35).

Dasgupta, Sivaprasad. "Some Measures of Generalization on Thematic Maps". Geographical Review of India, Vol. 26, No. 2, June, 1964, pp. 73-78.

Davis, J. C., & R. J. Sampson. "Fortran II Trend-Surface Program with unrestricted input for the IBM 1620 Computer". Kansas Geological Survey, University of Kansas, Special Distribution Publication, 1966.

_____. DBS-SSRS-GSSS, Mappak, An Automated Data Mapping Systems Users Manual, Version I, Ottawa, Canada, August, 1970.

deMeter, E. R. "Automatic Contouring". Nachr. Karten u. Vermessungswesen, Reihe V. No. 9, 1964.

_____. "Latest Advances in Automatic Mapping". Photogrammetric Engineering, Vol. XXIX, No. 6, November, 1963, pp. 1027-1036.

_____. "The Influence of Automation on Mapping Requirements and Techniques".

deVoe, R., & J. Pittsley. "Automatic Devices for Determining Map Co-ordinates (Project Michigan)". Michigan University Willow Run Labs., Report No. 2144-391-T, April, 1959.

Dial, R. B. "Street Address Conversion System", from Planning 1965, Proceedings of the Joint Planning Conference of ASPO and the Planning Association of Canada, Toronto, April, 1965, pp. 319-330.

Diello, J., K. Kirk, & J. Callander. "The Development of an Automated Cartographic System". The Cartographic Journal, Vol. 6, No. 1, June, 1969, pp. 9-17.

Division Informatique. Banque de Données Urbaines: Cartographie Numerique. Note de Synthese. Fevrier, 1970 McM/MG/MA.

Dodge, H. F. "Automatic Mapping System Design". Photogrammetric Engineering, Vol. 30, No. 2, March, 1964, pp. 238-242.

Domschke, P., H. J. Grunewald, G. Jehn, & O. Weibrecht. "Cartimat: A New Large Automatic Co-ordinatograph". Jena Review, Special Issue, Leipzig Spring Fair, 1966.

Dossi, S. W., M. G. Misulia, & C. S. Spooner, Jr. "Let's Go Over the Hill (Potential Benefits of Profile Scanning the Stereo Model)". Photogrammetric Engineering, Vol. 23, No. 5, December, 1957, pp. 909-920.

Downing, J. A. "The Automatic Construction of Contour Plots with Applications to Numerical Analysis Research". Defense Documentation Center Report AD 649811, January, 1966.

Dueker, Kenneth J. "Organization for the Retrieval of Spatially Distributed Data: A Land Use Data System (LUDS)". Proceedings on 4th Annual Conference on Urban Planning, Information Systems and Programs, University of California, 1966.

Eberly, S. W., & D. C. Noble. "Discussion: A Digital Computer Procedure for Preparing Beta Diagrams". American Journal of Science, Vol. 262, No. 9, 1964, pp. 1124-1129.

Edson, Dean T. "Time-Shared Co-ordinate Data Read Out System for Photogrammetric Equipment". Topographic Division, U.S. G.S., October, 1965.

_____. "The Geological Survey Nation wide Computing System. A Powerful tool for Topographic Mapping". Topographic Division, U.S. G.S., Washington, D.C., March, 1967.

Eller, Robert C., & Morris L. McKenzie. "Analytical Aerotriangulation Systems for Photogrammetric Mapping in the U. S. Geological Survey". U. S. Geological Survey, Washington, D.C.

_____. Environmental Systems Research Institute. Automap, Redlands, California, 1970.

Esten, Randall D. "Automated Mapping Systems", 4th United Nations Regional Cartographic Conference for Asia and Far East, Manila, 1964. V.2. Proceedings and Technical Papers, New York, United Nations, 1966, pp. 329-356.

Faiman, M., & J. Nievergelt, (eds.). Pertinent Concepts in Computer Graphics (Proceedings of the Second University of Illinois Conference on Computer Graphics, MAR-APR 1969). Urbana, Illinois, University of Illinois Press, 1969.

Farnsworth, G. L. "A Geographic Base File for Urban Statistical Analysis", presented to the Committee on Small Area Statistics at the American Statistical Association meeting, Pittsburgh, August, 1968.

Feder, J., & H. Freeman. "Digital Curve Matching Using a Contour Correlation Algorithm". Reprinted from 1966 IEEE International Convention Record, Part 3.

Ferragu, A., J. Salmana, A. Timmel, & D. Robequain. Banques de Données et Systemes d'Information Régionaux et Urbaines au Etas-Unis.

Fielding, Gordon. "Computer-Assisted Instruction in Geography". Journal of Geography, Vol. 67, 1968, pp. 474-483.

Fisher, H. T., et. al. Reference Manual for Synagraphic Computer Mapping (SYMAP) Version VI, Harvard University, Cambridge, June, 1970.

Fisher, Howard. Paper: "The Use of Computer Graphics in Planning", presented at the 1970 National Conference of the American Society of Planning Officials, April 6, 1970.

Forgotson, J. M. "How Computers Help Find Oil". The Oil and Gas Journal, March 18, 1963, pp. 100-109.

Found, W. C. "The Electronic Map Co-ordinate Digitiser". The Canadian Cartographer, December, 1970, Vol. 7, No. 2, pp. 131-136.

Fox, W. T. "Fortran and Fap Program for Calculating and Plotting Time-Trend Curves Using an IBM 7090 or 7094/1401 Computer System". Kansas Geological Survey, University of Kansas, Special Distribution Publication, 1964.

Freeman, Herbert. "Techniques for the Digital Computer Analysis of Chain-Encoded Arbitrary Plane Curves". Proceedings National Electronics Conference, Chicago, Illinois, Vol. 17, October, 1961, pp. 421-432.

Freeman, H., & J. Feder. "Digital Curve Matching Using a Contour Correlation Algorithm". Reprinted from 1966 IEEE International Convention Record, Part. 3.

Freeman, H., & S. P. Morse. "On Searching a Contour Map for a Given Terrain Elevation Profile". Journal of the Franklin Institute, Vol. 284, No. 1, July, 1967.

Fueschel, Charles F. "Automation in Cartography - A Study of Progress to Date". Engineering Graphics, Vol. 8, No. 4, April, 1968, pp. 6-11.

Gaits, G. M. "Mapping by Computer - LINMAP". The Cartographic Journal, Vol. 5, No. 2, December, 1968, p. 87. See more details in 1969 June edition.

_____. "Thematic Mapping by Computer". The Cartographic Journal, Vol. 6, No. 1, June, 1969, pp. 50-68.

Gajda, R. T. "Automation in Cartography". The Cartographer, Vol. II, No. 1, May, 1965, pp. 22-26.

Garfinkel, D. "Programmed Methods for Printer Graphical Output". Communications, Association for Computing Machinery, Vol. 5, No. 9, September, 1962, pp. 477-479.

Garrison, W. L., R. Alexander, W. Hailey, M. S. Dacey, & D. F. Marble. "Data Systems Requirements for Geographic Research". Technical Report No. 1, CNR Task 1, No. 389-142; Contract NONR 1288(35).

_____. General Electric Information Service Department, Automatic Plotting, Washington, D.C., 1967.

Gigas, E. "Automation in Cartography". Nachrichten aus dem Karten-und Vermessungswesen, Reihe V. Sonderhefts, No. 5, Frankfurt a. M, 1963.

Gilbert, Perry R. "The Numerical Map". The Military Engineer, Vol. 60, No. 395, May-June, 1968, pp. 194-196.

Gilman, W., & F. D. Schulman, et. al. "Optimized Digital Automatic Map Compilation System: Final Report". IBM, July 10, 1964.

Gilman, W. L., J. V. Sharp, R. L. Christensen, & F. D. Schulman. "Automatic Map Compilation Using Digital Techniques". Photogrammetric Engineering, Vol. 31, No. 2, March, 1965, pp. 223-239.

Glickman, Roger Jay. Manual for the Printing of Literary Texts and Concordances by Computer (Preliminary ed. 1970).

Goldstein, H. L. Computer Mapping User's Study with an Emphasis on Planning, mimeo paper, Urban Studies Centre, Battelle Memorial Institute, June, 1969.

Goldstein, Wertz & Sweet. Computer Mapping; a Tool for Urban Planners, Battelle Memorial Institute, Columbus, Ohio, March, 1969.

Good, D. I. "Fortran II Trend-Surface Program for the IBM 1620". Kansas Geological Survey, University of Kansas, Special Distribution Publication, 1964.

Gorssimon, Herbert P. "Progress Report on Some Recent Computer/ Graphics Systems". Conford Control Inc., 1282 Soldiers Field Road, Boston, Massachusetts 02135, Paper 147, - presented to ASP-ACSM Convention, March, 1967.

Grabbe, E. M., Simon Ramo, & D. E. Wooldridge. Handbook of Automation, Computation, and Control, John Wiley & Sons, Inc., New York, 1959, Vol. II.

Green, Jack & Gary A. McCue. "Pisgah Crater Terrain Analysis". Photogrammetric Engineering, Vol. XXXI, No. 5, September, 1965, pp. 810-821.

Greenberg, G. L. "Manifold Map Base Forms for Electronic Data Processing". Paper presented at the 1962 St. Louis Conference of the American Congress on Surveying and Mapping.

Greysukh, V. L. "The Possiblity of Studying Landforms by Means of Digital Computers". Soviet Geography, Vol. 8, 1967, pp. 137-149.

Greysukh, V. L., & V. V. Kosmin. "Analytical Representation of Local Relief on an Electronic Computer". Geodesy and Aero Photography, No. 6, 1964, pp. 341-344.

"GRID". "A Computer Mapping Program Designed to Display Data which has been Collected on the Basis of Grid Cells--Brief Description, Technical Specifications and Order Form".

Grunewald, H. J., P. Domschke, G. Jehne, & O. Weibrecht. "Cartimat: A New Large Automatic Co-ordinatograph". Jena Review, Special Issue, Leipzig Spring Fair, 1966.

Gutterman, M. M., & R. S. Hollitch, Eds. "Computer Applications". Proceedings of a Symposium held in Chicago, 1962, IIT Research Institute.

Hägerstrand, T. "The Computer and the Geographer". Institute of British Geographers Transactions, Transaction 42, December, 1967, pp. 1-19.

Haggett, Peter. "On Geographical Research in a Computer Environment". Geog. Jour., Vol. 135, Pt. 4, 1969, pp. 497-507.

Haggett, Peter, & R. J. Chorley. "Trend-Surface Mapping in Geographical Research". Institute of British Geographers Transactions, Transaction No. 37, 1965, pp. 47-67.

Harbaugh, J. W. "Balgol Program for Trend-Surface Mapping using an IBM 7090 Computer". Kansas Geological Survey, Special Distribution Publication 3, 17 p., 1963.

_____. "Direct Printing of Computer Maps of Facies Data by Computer". Bulletin, Association of Petroleum Geologists, Vol. 46, No. 1, 1962, p. 268.

Harbaugh, John W., & Daniel F. Merriam. Computer Applications in Stratigraphic Analysis, John Wiley & Sons, Inc., New York, 1968.

Harbaugh, J. W., & D. F. Merriam. "Computer Helps Map Oil Structures". Oil and Gas Journal, Vol. 61, No. 47, November 25, 1963, pp. 158-163.

Harries, Keith D. "The Geography of American Crime. (Application of Computer-Generated Maps)., Jour. Geog., April, 1971, Vol. LXX, No. 4, p. 204.

Harris, L. J. "An Approach to Automatic Cartography for Topographic Mapping in Canada". The Canadian Cartographer, December, 1971, Vol. 8, No. 2, p. 90. (forthcoming for June, 1972, Vol. 9, No. 1, by same author - 'Automated Cartography in Federal Mapping in Canada).

Harvard University News Release. "Computer Map-Making". Special Libraries Association, Geography and Map Division, Bulletin No. 64, June, 1966, pp. 12-15.

Hayes, Robert M., & Joseph Becker. Information Storage and Retrieval Tools Elements Theories, John Wiley and Sons, New York, New York, 1963.

Hayes, T. J. "Mapping Evolution in the Next Decade". The Military Engineer, Vol. 58, No. 383, May-June, 1966, pp. 157-159.

Hedborn, Olof. "From Manual to Automated Plotting on Thematic Maps". International Year Book of Cartography, Vol. 2, 1962, pp. 148-150.

Heitman, Richard E., Paul Switzer, & C. Michael Mohr. Statistical Analyses of Ocean Terrain and Contour Plotting Procedures, Arthur D. Little Inc., Cambridge, April, 1964.

Hermansen, T. Systems d'Information pour la Planification du Developpement Regional: Problematqiue.

Hershey, A. V. "The Plotting of Maps on a CRT Printer". NWL Report 1844, U. S. Navy, Dahlgren, 1963.

Hollitch, R. S., & M. M. Gutterman, Eds. "Computer Applications". Proceedings of a Symposium held in Chicago, 1962, IIT Research Institute.

Hollitch, R. S., & B. Mittman, Eds. "Computer Applications", Proceedings of a Symposium held in Chicago, 1961.

Horton, Frank E. "Computer Mapping Conference". The Professional Geographer, Vol. XIX, No. 6, November, 1967, p. 358.

Horwood, E. M. "Using Computer Graphics in Community Renewal: Community Renewal Program Guide No. 1". Washington, D.C., U. S. Government Printing Office, 1963.

Horwood, E., & C. Rogers. "Research and Development of Electronic Mapping". The Trend in Engineering, Vol. 13, No. 4, October, 1961, pp. 9-12.

Howlett, B., & H. Schneider. The Use of Computer Graphics in the Hudson River Valley, paper presented at the Second Annual Symposium of the Association for Computing Machinery, November, 1968.

Hunter, C. L. "Trivia". Surveying and Mapping, Vol. 17, No. 2, April, 1957, pp. 183-184.

IBM. "Automatic Grid Contouring". IBM 1620 Program Library, 1620-MP-09X, May, 1963.

_____. "Contouring by Triangulation". Program Writeup, IBM Program No. 1620-MP-21X.

_____. "Grid Value Determination". IBM 1620 Program Library, 1620-MP-08X, May, 1963.

IBM. "Numerical Surface Techniques and Contour Map Plotting, E 20-0117-0". White Plains, New York: IBM Data Processing Division, 36 pp., 1965.

Imhof, Edward. (translated and revised by Ernst Spiess and Mylon Merriam). "Tasks and Methods of Theoretical Cartography". International Year Book of Cartography, Vol. 3, Zurich, Orell Fussli Verlag, 1963, pp. 13-23.

Jehne, G., P. Domschke, H. J. Grunewald, & O. Weibrecht. "Cartimat: a New Large Automatic Co-ordinatograph". Jena Review, Special Issue, Leipzig Spring Fair, 1966.

Johnson, T. E. "Sketchpad III: A Computer Program for Drawing in Three Dimensions". Proc. AFIPS 1963 Spring Joint Comput. Conf., Vol. 23, pp. 347-353.

Johnson, W. L., J. W. Sanders, & N. E. South. "Analytical Surfaces for Computer-aided Design". Graphic Science, Vol. 8, No. 4, April, 1966, pp. 14-23.

Jones, Garred P., & J. Douglas Carroll, Jr. "Interpretation of Desire Line Charts Made on a Cartographatron". Chicago: Chicago Area Transportation Study, January, 1960, 33 pp. Also in Highway Reserve Board Bulletin, No. 86, 1960, p. 108.

Jones, G. P., & J. Douglas Carroll, Jr. "The Cartaphotron". Traffic Engineering, No. 7, 1960, pp. 18-25.

Jones, Ken. The Norwegian Geodata System: A Proposal for the Improvement of Regional Data through the Use of the Co-ordinate Method. Paper prepared for the Urban Data Management Symposium March 30th-April 2, 1971. Bonn.

Kao, Richard C. "The Use of Computers in the Processing and Analysis of Geographical Information". Geographical Review, Vol. 53, No. 4, 1963, pp. 530-547.

Kern, R., & G. Rushton. "Mapit: A Computer Program for Production of Flow Maps, Dot Maps and Graduated Symbol Maps". Cartographic Journal, Vol. 6, No. 2, December, 1969, pp. 131-137.

Kirk, K., J. Diello, & J. Callander. "The Development of an Automated Cartographic System". The Cartographic Journal, Vol. 6, No. 1, June, 1969, pp. 9-17.

Kitchen, J. E. Proceedings of the Second Annual Workshop in Computer-Assisted-Instruction, Waterloo Lutheran University, Ontario, November 21, 1969.

Klichen, Mann A. "Newe Anwendungsbeispiele von quantitativen Methoden, Computer und Plotter in der Geographie une Kartographie". Geog. Helvetica 24, Jahrgang 2, Quartal-sheft 1969, pp. 68-81.

Koeman, C. "Photo-Photomap-Map", ITC Publications, No. A/B 7, 1961.

Kolberg, D. W. "Population Aggregations as a Continuous Surface: An Example of Computer Mapping". The Cartographic Journal, December, 1970, Vol. 7, No. 2, pp. 95-100.

Konecny, Gottfried & David H. Refoy. "Maps from Digitized Stereomat Data". Photogrammetric Engineering, Vol. 34, No. 1, 1968, pp. 83-90.

Kosmin, V. V. & V. L. Greysukh. "Analytical Representation of Local Relief on an Electronic Computer". Geodesy and Aerophotography, No. 6, 1964, pp. 341-344.

Kosofsky, L. J. "Investigation of an Integrated Mapping System". Photogrammetric Engineering, Vol. XXIV, No. 3, June, 1958, pp. 458-467.

Krumbein, W. C. "Computer Analysis on Stratigraphic Maps". Abstract, Bulletin of American Association of Petrol. Geol. Vol. 46, Part 1, 1962, p. 270.

_____. "The General Linear Model in Map Preparation and Analysis, Part II". U. S. Government Research & Development Reports. AD-655446, Vol. 57, September 25, 1967, p. 59.

_____. "Trend Surface Analysis of Contour - Type Maps with Irregular Control-Point Spacing". Journal of Geophysical Research, Vol. 64, No. 7, 1959, pp. 823-834.

Krumbein, Wm. C., & E. H. Timothy Whitten. "A Surface-fitting Program for Areally-Distributed Data from the Earth Sciencesand Remote Sensing". NASA Contractor Report 318, November, 1965, 146 pp.

Laboratory for Computer Graphics. "User's Reference Manual for Synagraphic Computer Mapping 'SYMAP' Version V." Lab. for Computer Graphics, Harvard University, June, 1968.

_____. Context, Graduate School of Design, Harvard University, Cambridge, February, 1968.

_____. A Report of Feasibility of Using Computer Mapping Techniques as an Aid in the Processing of Mortgage Insurance Applications, Harvard University, Cambridge, 1969.

_____. Current Listing of Harvard Papers in Theoretical Geography, Harvard University, Cambridge, 1970.

Lang, T. Computer Programs for Mapping, by Experimental Cartography Unit. (to September, 1970) Architectural Press, 1971.

Latham, James P. "Methodology for an Instrumental Geographic Analysis". Annals of the Association of American Geographers, Vol. 53, No. 2, June, 1963, pp. 194-209.

_____. "A Study of Electronic Scanning Computer Devices to the Analysis of Geographic Phenomena". Report to U. S. Office of Naval Research, Geography Branch, N.R. No. 387-023.

_____. "Possible Applications of Electronic Scanning and Computer Devices to the Analysis of Geographic Phenomena". O.N.R. Technical Report No. 1. Report to U. S. Office of Naval Research, Geography Branch, N.R. No. 287-023.

Laurila, Simo., H., & L. L. S.Mathur. Fortran Programs for Transformation between Rectangular and Geographic Map Coordinates. Honolulu, Hawaii, University of Hawaii, Hawaii Institute of Geophysics, 1969.

Lavrov, N.P.* "Prospects for Automatic Map Compilation, Preparation, and Reproduction". 20th International Geographical Congress, Abstracts of Papers, F. E. Ian Hamilton, Ed. Thomas Nelson & Sons Ltd., London, 1964. *Academy of Sciences, Moscow, U.S.S.R.

Lawrence, Charles P. "Stereomat IV, Automatic Plotter". Photogrammetric Engineering, Vol. 33, No. 4, April, 1967, pp. 394-402.

"Le Registre des Etablissements: La Premiëre Etape du Développement d'un Systeme d'Information Industriel". Par. I. Osipou.

"Le Systeme d'Information Industrielle: Leoen, C. "Rapport Provisoire de la Réunion d'Afrique Orientale sur les Données pour la Programmation Industrielle".

_____. Le Mole des Banques de Données Régionales dans le Contexte d'un Systeme de Banques de Données Nationales et Locales, Saint Louis, U.S.A.

"L' Automisation: Une ëre nouvelle pour la cartographie". M-Th. Gambin, Assoc. de Géographes Francais, Bull. No. 379-380 Mars-Avril, 1970, pp. 93-103.

Lee, H. C., M. A. Rosenfeld, I. H. Cram, Jr., H. A. Slack, & G. D. Brunton. "Now-Map Making Made Accurate, Objective". Oil and Gas Journal, Vol. 61, No. 31, August 5, 1963, pp. 158-170.

Leith, H., & J. S. Radford. Phenology, Resource Management and Synagraphic Computer Mapping, University of North Carolina, mimeographed paper, November, 1970.

Le Moli, G., & G. Cottafava. "Automatic Contour Map". Comm. ACM (Assoc. for Computing Machinery), Vol. 12,No. 7, July, 1969, pp. 386-391.

Levy, Walter A. "Programming the Automatic Cartographic System". Informatics Inc. - presented at the March, 1967 ASP-ACSM Convention in Washington, D.C.

Leyland, G. P. "Implications of the New Haven Census Use Test for Transportation and Land Use Planning , presented at the Highway Research Board meeting, Washington, D.C., January, 1968.

Light, Donald L. "Ranger Mapping by Analytics". Photogrammetric Engineering, Vol. 32, No. 5, September, 1966, pp. 792-800.

Lindgren, C. "N-dimensional Spatial Analysis and Computer Graphics: Part A". Lab for Computer Graphics and Spatial Analysis, Graduate Schoo. of Design, Harvard University, 1968.

Livingstone, F. C. "Automatic Map Making". The Military Engineer, Vol. 57, No. 375, January-February, 1965, pp. 55-56.

Loomis, R. G., & J. J. Lorenzo. "Experiments in Mapping with a Geo-Space Plotter", in Urban and Regional Information Systems for Social Programs, New York, September, 1967.

MacKay, J. Ross. "Some Cartographic Problems in the Field of Special (thematic) Maps". Canadian Cartography, Vol. 1, 1962, pp. 42-47.

Magnan, George A. "Automatic Mapmaking at VTN". Engineering Graphics, June, 1970, pp. 8-18.

Makarovic, I. B. "Semi-Automatic Mapping Techniques." Photogrammetric Engineering, May, 1971, Vol. 37, No. 5, pp. 475-80.

Mandelbaum, H. "Statistical and Geological Implications of Trend Mapping with Nonorthogonal Polynomials". Journal of Geophysical Research, Vol. 68, No. 2, January, 1963, pp. 505-519.

Maps and Computers, Metropolitan Planning Commission, Portland, Oregon, June, 1967.

"Maps a la Computers," reprint of a March 11, 1970 article that appeared in the Christian Science Monitor.

Marble, Duane F. "Some Computer Programs for Geographic Research." Department Geography, Northwestern University, Evanston, Illinois, Special Publication No. 1, August, 1967, 201 pp.

Marble, D. F., & M. F. Dacey. "Some Comments on Certain Technical Aspects of Geographic Information Systems." Technical Report No. 2, ONR Task 1, No. 389-142; Contract NONR 1288(35).

Marble, D. F., W. L. Garrison, R. Alexander, W. Bailey, & M. S. Dacey. "Data Systems Requirements for Geographic Research." Technical Report No. 1, ONR Task 1, No. 389-142; Contract NONR 1288(35).

Margerison, T. "Drawing for a Computer." New Scientist, Vol. 27, No. 450, July, 1965.

Massey, J.S. "Computer Mapping: Review." Australian Geographical Studies, 8: 91-95 (1970).

Mays, Raymond R., Arthur A. Noma, & Wm. C. Aumen. "Digitizing Graphic Data at the Army Map Service." Corps of Engineers, U. S. Army, Army Map Service, Washington, D.C., 20315.

McCue, Gary A., & Jack Green. "Pisgah Crater Terrain Analysis." Photogrammetric Engineering, Vol. XXXI, No. 5, September, 1965, pp. 810-821.

McCullagh, M. J. "Some Aspects of Network Analysis." Computer Applications in the Natural and Social Sciences, No. 2, 1969, Nottingham University, Department of Geography.

_____. "Data Processing Package," ditto. No. 5, 1969.

McGlashan, N. D., & D. H. Bond. "A Method of Using Computer Assistance in Mapping Geographical Synoptic Data." Die Erde, Vol. 98, No. 4, 1967, pp. 292-297.

McKay, C. J. "Automation Applied to Area Measurement." Symposium of the British Cartographic Society, University College of Swansea, September, 1965, pp. 22-25 (with discussion); in The Cartographic Journal, Vol. 3, No. 1, 1966.

McKenzie, Morris L.& Robert C. Eller. "Analytical Aerotriangulation Systems for Photogrammetric Mapping in the U. S. Geological Survey." U. S. Geological Survey, Washington, D.C.

McLellan, C. D. "Computer Program: GALS." The Canadian Surveyor, Vol. 25, No. 2, Ottawa, June, 1971, pp. 115-123.

Merriam, Daniel F., & J. W. Harbaugh. Computer Applications in Stratigraphic Analysis, John Wiley & Sons, Inc., New York, 1968.

Merriam, Daniel F. (ed.). Computer Applications in the Earth Sciences. New York: Plenum, 1969.

Merriam, D. F., & J. W. Harbaugh. "Computer Helps Map Oil Structures." Oil and Gas Journal, Vol. 61, No. 47, November 25, 1963, pp. 158-163.

Merriam, D. F., & P.M.A. Sneeth. "Quantitative Comparison of Contour Maps." Journal of Geophysical Research, Vol. 71, No. 4, 1966, pp. 1105-1115.

Michigan Dept. of Commerce. "Outdoor Recreational Planning in Michigan by a Systems Analysis Approach: Part II Computer Mapping for Recreational Planning." Technical Report #3, August, 1966, Michigan Department of Commerce.

Mikheyeva, V. S. "Application of Mathematical Methods and Computer Techniques in Economic-Geographic Research." Soviet Geography, Vol. 6, No. 9, 1965, pp. 39-43.

Miller, O. M., & R. J. Voskuil. "Thematic-Map Generalization." The Geographical Review, Vol. 54, January, 1964, pp. 13-19.

Minton, G., & H. H. Fastewu. Automated Geographic Coding System, 1963 Economic Censuses: Research Report No. 1, Operations Research, Economic Operations Division, U. S. Bureau of the Census, June, 1965.

Misulia, Michael G., & Arthur A. Nema. "Programming Topographic Maps for Automatic Terrain Model Construction." Surveying and Mapping, Vol. XIX, No. 3, September, 1959, pp. 355-366.

Misulia, M. G., C. S. Spooner, Jr., & S. W. Dossi. "Let's Go Over the Hill (Potential Benefits of Profile Scanning the Stereo Model)." Photogrammetric Engineering, Vol. 23, No. 5, December, 1957, pp. 909-920.

MIT. "Contour Plot Program." Massachusetts Institute of Technology Computation Centre, Share #506, 1968.

Mittman, B., & R. S. Hillitch, Eds. "Computer Applications". Proceedings of a Symposium held in Chicago, 1961.

Mohr, C. Michael, Richard E. Heitman, & Paul Switzer. Statistical Analyses of Ocean Terrain and Contour Plotting Procedures. Arthur D. Little Inc., Cambridge, April, 1964.

Momsen, Richard P. Jr. "The Orthophoto Map - Geographic Tool of the Future." The Professional Geographer, Vol. XX, No. 3, May, 1968, pp. 177-180.

Monmonier, Mark S. "Computer Mapping with the Digital Increment Plotter." The Professional Geographer, Vol. XX, No. 6, November, 1968, pp. 408-409.

_____. "Digitised Map Measurement and Correlation Applied to an Example in Crop Ecology." Geog. Rev., Vol. 61, No. 1, January, 1971, pp. 51-71.

_____. "The Production of Shaded Maps on the Digital Computer." The Professional Geographer, Vol. 17, No. 5, September, 1965, pp. 13-14.

_____. "The Scope of Computer Mapping." Special Libraries Assoc. Geog. & Map Division Bull., No. 81, September, 1970, pp. 2-14.

_____. "Shaded Area Symbols for the Digital Increment Plotter." Tijdschrift voor Economische en Social Geografie, Vol. 61, 1970, pp. 374-378.

Monmonier, M. S., J. L. Pfaltz, & A. Rosenfeld. "Surface Area from Contour Maps." Photogrammetric Engineering, Vol. 32, No. 3, May, 1966, pp. 476-482.

Monmonier, Mark S. "Upland Adjustment to Regional Drainage in Central Pennsylvania: An Application of Trend Surface Analysis." The Journal of Geog., Vol. LXXX, No. 6, September, 1971, pp. 360-370.

Montgomery, C. J. "Computer Permits Simplified Field Surveying Methods." Surveying and Mapping, Vol. XXVI, No. 3, September, 1966.

_____. "Impact of Computers on Surveying Methods." Journal of the Surveying and Mapping Division, Proceedings of the American Society of Civil Engineers, Vol. 94, No. SUI, January, 1968, pp. 25-36.

_____. "Impact of Electronic Computers on Survey Computations." Surveying and Mapping, Vol. XXV, No. 1, March, 1965.

Moore, R. T., M. C. Stark, & L. Cahn. "Digitizing Pictoral Information with a Precision Optical Scanner." Photogrammetric Engineering, Vol. 30, No. 6, November, 1964, pp. 923-931.

Morrill, Richard L., Waldo R. Tobler, & Brian J.L. Berry. "Geographical Ordering of Information - New Opportunities." The Professional Geographer, Vol. 16, No. 4, July, 1964, pp. 39-44.

Morse, Stephen P. "A Mathematical Model for the Analysis of Contour-Line Data." New York University Lab. for Electro Science Research, Technical Report 400-124, October, 1965, 48 pp.

Morse, S. P. "A Topological Approach to the Problem of Searching on a Contour Map." Technical Report 400-129, Department of Electronic Engineering, New York University, Bronx, New York, January, 1966.

_____. "Computer Storage and Analysis of Contour Map Data." New York University Laboratory for Electro-Science Research, Technical Report 400-106, February, 1965, 67 pp.

_____. "Computer Storage of Contour-Map Data." Proceedings of the 23rd National Conference ACM, August, 1968, pp. 45-51.

_____. "Concepts of Use in Contour Map Processing." Communications of the ACM, Vol. 12, No. 3, March, 1969, pp. 147-152.

_____. Generalized Computer Techniques for the Solution of Contour-Map Problems. Doctoral Dissertation, Department of Electronic Engineering, New York University, Bronx, New York, 1967. Technical Report 400-149, Laboratory for Electro-Science Research, New York University, December, 1966.

Morse, S. P., & H. Freeman. "On Searching a Contour Map for a Given Terrain Elevation Profile." Journal of the Franklin Institute, Vol. 284, No. 1, July, 1967.

Mullen, Roy R. "The U.S.G.S. Autoplot System." Topographic Division, March, 1967 - prepared for presentation at the 33rd Annual Meeting of the ASP, Washington, D.C., March 5-10, 1967.

Murphy, M. "Map Collection Prepares to Automate; the U. S. Army Topographic Command Library." Special Libraries, Vol. 61, No. 4, April, 1970, pp. 180-189.

Murray, F. W. "A Method of Objective Contour Construction." Clearinghouse, U. S. Department of Commerce, Springfield, Virginia, AD 666030, February, 1968, 26 pp.

Murray, Malcolm A. "Training Conference on Computer Mapping at Harvard University, May 8-19, 1967 - A Report." The Professional Geographer, Vol. XIX, No. 4, July, 1967, pp. 215-216.

Negroponte, N. Urban Five: An On-Line Urban Design Partner, presented at the First Annual International Conference of the Design Methods Group, Cambridge, Massachusetts, June, 1968.

Neilon, J. R., & J. C. Cain. "Automatic Mapping of the Geomagnetic Field." Journal of Geophysical Research, Vol. 68, No. 16, August, 1963, pp. 4689-4696.

Nelson, David L. "Perspective Plotting of Two-Dimensional Arrays: Plot 3D: A Computer Program for a Digital Plotter." Technical Report 553. Dept. Physics, University of Maryland.

Newsletter. Context. Laboratory for Computer Graphics (Harvard) First Issue, February, 1968.

Newton, Rita M., & Warren H. Thomas. "Design of School Bus Routes by Computer." Socio-Economics Planning Science, Vol. 3, pp. 75-85, 1969.

Noble, D. C., & S. W. Eberly. "Discussion: A Digital Computer Procedure for Preparing Beta Diagrams." American Journal of Science, Vol. 262, No. 9, 1964, pp. 1124-1129.

Noma, Arthur A., Raymond R. Mays, & W. C. Aumen. "Digitizing Graphic Data at the Army Map Service." Corps of Engineers, U. S. Army, Army Map Service, Washington, D.C., 20315.

Noma, Arthur A., & Michael G. Misulia. "Programming Topographic Maps for Automatic Terrain Model Construction." Surveying and Mapping, Vol. XIX, No. 3, September, 1959, pp. 355-366.

Nordbeck, Stig. "Location of Areal Data for Computer Processing." Royal University of Lund, Sweden, Department of Geography, C.W.K. Gleerap Publishers/Lund, 1962.

Nordbeck, Stig & Bengt-Erik Bengtsson. "Construction of Isarithms and Isarithmic Maps by Computers." University of Lund, Sweden, BIT 4, 1964, pp. 87-105.

Nordbeck, Stig & Bengt Rystedt. "Computer Cartography, Point in Polygon Programs." Royal University of Lund, Sweden, Department of Geography, C.W.K. Gleerap Publishers/Lund, 1967.

Nussbaum, E. "Automatic Plotting and Digitizing," in Urban and Regional Information Systems for Social Programs, papers from the Fifth Annual Conference of the Urban and Regional Information Systems Association, New York, September, 1967, pp. 234-261.

Ojakangas, D. R., & W. L. Basham. "Simplified Computer Contouring of Exploration Data." Stanford University Publications, Geological Sciences, Vol. 9, No. 2, pp. 757-770.

Olsson, Annaliisa. "A Spatial Information System: A Pilot Study, C.F.D." Central Board for Real Estate Data. FRIS. C,3, May, 1971. Kosp. Retrieval, Pytom calculation of areas and circumferences, Ritai Plotting.

Olsson, Annaliisa & Krister Selander. "A Spatial Information System. A Pilot Study. Dot Maps by Computer. CFD." Central Board for Real Estate Data, FRIS. C;2, November, 1970.

Organick, E. I. "A Computer Primer for the MAD Language." Ann Arbor, 1961.

"OTOTROL: A Computer Perspective Drawing Program--Brief Descriptions of the Introductory Correspondence Course and Program with Technical Specifications and Order Form."

Ovington, J. J. "Automation and Map Production in Australia." Cartography, Vol. 6, No. 4, June, 1968, pp. 184-187.

Pannekoek A. J. (translated and revised by Seeger-Wolf and Sijmons). "Generalization of Coastlines and Contours." International Year Book of Cartography, Vol. 2, Zurich, Orell Fussli Verlag, 1962, pp. 61-73.

Parslow, R. D., & R. Elliot Green (eds.). Advanced Computer Graphics: Economics, Techniques and Applications. New York: Pleum, 1971, 1230 pp.

Perks, Michael. "Cosmos - A Fortran Program for the Computation of Survey Material on the Spheroid." The Canadian Surveyor, Vol. XXI, No. 4, September, 1967, pp. 334-338.

Perry, R. Gilbert. "The Numerical Map." The Military Eng., Vol. 60, No. 395, May/June, 1968, pp. 194-196.

Petrie, G. "Numerically Controlled Methods of Automatic Plotting and Draughting." The Cartographic Journal, Vol. 3, No. 2, December, 1966, pp. 60-73.

_____. "The Automatic Plotter and its Consequences." Proceedings of the Cartographic Symposium, Edinburgh, December, 1962, pp. 29-40.

Pfaltz, J. L. Manipulation and Display of Geographically Distributed Data, paper presented at the Third Technical Conference of the Council of Social Science Data Archives, Ann Arbor, Michigan, May, 1966.

Pfaltz, John L. Pattern Recognition VI - MANS. A Map Analysis System, University of Maryland Computer Science Center, College Park, Maryland, February, 1967, Technical Report TR-67-42, NsG-398.

Pfaltz, John L., & Azriel Rosenfeld. "Computer Representation of Planar Regions by Their Skeletons." Communications of the ACM, Vol. 10, No. 2, February, 1967, pp. 119-123.

Pfaltz, J. L., A. Rosenfeld, & M. S. Monmonier. "Surface Area from Contour Maps." Photogrammetric Engineering, Vol. 32, No. 3, May, 1966, pp. 476-482.

Pittsley, J., & R. DeVoe. "Automatic Devices for Determining Map Co-ordinates (Project Michigan)." Michigan University Willow Run Labs., Report No. 2144-391-T, April, 1959.

Porteous, J. D. "Computer Graphics, a Further Note." Area 1969, No. 3, pp. 37-39.

Porter, Philip W. A Bibliography of Statistical Cartography, Department of Geography, University of Minnesota, June, 1964, 65 pp.

Proceedings of the 23rd National Conference ("A two-dimensional Interpolation Function of Irregularly Spaced Data.") Association of Computing Machinery. A.C.M. Publication. Princeton: Brandon/System Press 1969.

Rall, L. L. "Geographic Data Processing." Photogrammetric Engineering, Vol. 32, No. 6, 1966, November, pp. 978-986.

Ramo, Simon, E. M. Grabbe, & D. E. Wooldridge. Handbook of Automation, Computation, and Control, John Wiley & Sons, Inc., New York, 1959, Vol. II.

Randall, D. E. "Automatic Photogrammetric Instruments." Photogrammetric Engineering, Vol. XXX, No. 4, July, 1964, pp. 544-558.

Refoy, David H., & Gottfried Konecny. "Maps from Digitized Stereomat Data." Photogrammetric Engineering, Vol. 34, No. 1, 1968, pp. 83-90.

Reilly, James P., Ron K.H. Adler, & C. R. Schwartz. "A Generalized System for the Evaluation and Automatic Plotting of Map Projections." The Canadian Surveyor, Vol. 22, No. 5, 1968, pp. 442-450.

Rentmeester, L. F. "The Universal Cartographic Data Base." The Canadian Cartographer (formerly, The Cartographer), Vol. 5, No. 1, 1968, pp. 42-49.

Rhodes, T. "User Operating Instructions for the LINMAP 1 Computer Mapping System." Technical Manual No. 1, Urban Planning Directorate, M.H.L.G., 1968. "Data Inputs to the LINMAP 1 Package," Technical Manual No. 2, Ibid.

Roberts, J. A. "The Topographic Map in a World of Computers." The Professional Geographer, Vol. 14, No. 6, November, 1962, pp. 12-13.

Robertson, J. C. "The SYMAP Programme for Computer Mapping." The Cartographic Journal, Vol. 4, No. 2, December, 1967, pp. 108-113.

Robinson, Arthur H. Elements of Cartography, John Wiley & Sons, Inc., New York, 1953, pp. 170-176, 195-201.

_____. "The Cartographic Representation of the Statistical Surface." International Year Book of Cartography, Vol. 1, Zurich, Orell Fussli Verlag, 1961, pp. 53-61.

Robinson, Arthur H., & Bruce Cornwell. "Possibilities for Computer Animated Films in Cartography." The Cartographic Journal, Vol. 3, No. 2, 1966, pp. 79-82.

Rodda, John C. "A Trend Surface Analysis Trial for the Planation Surfaces of North Cardiganshire." T.R.I.B.G. July, 1970, No. 50, pp. 107.

Rogers, C., & E. Horwood. "Research and Development of Electronic Mapping." The Trend in Engineering, Vol. 13, No. 4, October, 1961, pp. 9-12.

Rosen, H. L., Ed. Programme - News from the University of Ottawa Computing Centre, Vol. 2, No. 2, July, 1969.

Rosenfeld, M. A., I. H. Cram, Jr., H. A. Slack, G. D. Brunton, & H. C. Lee. "Now-Map Making Made Accurate, Objective." Oil and Gas Journal, Vol. 61, No. 31, August 5, 1963, pp. 158-170.

Rosenfeld, A., M. S. Monmonier, & J. L. Pfaltz. "Surface Area from Contour Maps." Photogrammetric Engineering, Vol. 32, No. 3, May, 1966, pp. 476-482.

Rosenfeld, Azriel & John L. Pfaltz. "Computer Representation of Planar Regions by Their Skeletons." Communications of the ACM, Vol. 10, No. 2, February, 1967, pp. 119-123.

Rosing, Kenneth E., & P. A. Wood. Character of a Conurbation - A Computer Atlas of Birmingham and the Black Country. University of London Press, Ltd. 1971.

Rosing, Kenneth E. "Computer Graphics." Area, Vol. 1, 1969, p. 27.

Rosing, K. E., & P. A. Wood. "Automated Urban Planning." The Geographical Magazine, Vol. XLII, No. 1, October, 1969, pp. 60-64.

Rystedt, Bengt & Stig Nordbeck. "Computer Cartography, Point in Polygon Programs." Royal University of Lund, Sweden, Department of Geography, C.W.K. Gleerap Publishers/Lund, 1967.

Salmona, Jean U. Étapes Principales de la Mise en Oeuvre d'une Banque de Données pour le Préparation des Decisions. Organisation des Nations Unies pour le Développement Industriel. Vienna, Autriche 16-20, November, 1970.

Salomonsson, O. Quelques Problèmes d'Identification, d'Integration et l'Organisation des Données dans les Systèms d'Information Urbaines et Régionaux. Bureau Centrale, National de Statistiques. Stockholm, Suede.

Sampson, R. J., & J. C. Davis. "Fortran II Trend-Surface Program with Unrestricted Input for the IBM 1620 Computer." Kansas Geol. Survey, University of Kansas, Special Distribution Publ., 1966.

Sanders, J. W., N. E. South, & W. L. Johnson. "Analytical Surfaces for Computer-aided Design." Graphic Science, Vol. 8, No. 4, April, 1966, pp. 14-23.

Schmidt, A. H. SYMAP, A User's Manual. Tri-County Regional Planning Commission, Lansing, Michigan, May, 1966.

Schmidt, Warren E. "The Automap System." Surveying and Mapping, Vol. XXIX, No. 1, March, 1969, pp. 101-106.

Schöler, H. "Stereotrigomat Universal Mapping System." Photogrammetric Engineering, Vol. 33, No. 4, 1967, pp. 411-426.

Schulman, F. D., & W. Gilman, et. al. "Optimized Digital Automatic Map Compilation System: Final Report." IBM, July 10, 1964.

Schulman, F. D., J. V. Sharp, R. L. Christensen, & W. L. Gilman. "Automatic Map Compilation Using Digital Techniques." Photogrammetric Engineering, Vol. 31, No. 2, March, 1965, pp. 223-239.

Schwartz, C. R., Ron K.H. Adler, & James P. Reilly. "A Generalized System for the Evaluation and Automatic Plotting of Map Projections." The Canadian Surveyor, Vol.22, No. 5, 1968, pp. 442-450.

Selander, Krister. "A Spatial Information System. A Pilot Study. Registration and Storing of Co-ordinates. C.F.D." Central Board for Real Estate Data. Development Department, FRIS. C:1, October, 1970.

Selkowitz, Stephen E. "Geography and an Existence Theory; a Cartographic Computer Solution to the Localization on a Sphere of sets of Equal-valued Antipodal Points for two continuous Distributions, with Practical Applications to the Real Earth." Lab. for Computer Graphics and Spatial Analysis, Harvard University, 1968.

Sharp, J. V., R. L. Christensen, W. L. Gilman, & F. D. Schulman. "Automatic Map Compilation Using Digital Techniques." Photogrammetric Engineering, Vol. 31, No. 2, March, 1965, pp. 223-239.

Shepard, Donald. "A Two-Dimensional Interpolation Function for Computer Mapping of Irregularly Spaced Data." Harvard Papers in Theoretical Geography, "Geography and the Properties of Surfaces," Series, 20 March 1968.

Shepherd, Wesley H. "Automatic Contour Digitizer." Photogrammetric Engineering, Vol. XXXIV, No. 1, January, 1968, pp. 75-82.

Sherman, John C. "New Horizons in Cartography - Functions, Automation, and Presentation." International Year Book of Cartography, Vol. 1, 1961, pp. 13-17.

Shostack, K., & Charles Eddy. "Management by Computer Graphics." Harvard Business Review, November-December, 1971, 12 pp.

Siders, R. A., et. al. Computer Graphics, Bailey Bros. & Swinfen, London, 1966.

Sinclair, R. E. "A Survey of Automatic Map Compilation Processes." Surveying and Mapping, Vol. 29, No. 2, June, 1969, pp. 299-305.

Slack, H. A., G. D. Brunton, H. C. Lee, M. A. Rosenfeld, & I. H. Cram, Jr. "Now-Map Making Made Accurate, Objective," COMMAP Oil and Gas Journal, Vol. 61, No. 31, August 5, 1963, pp. 158-170.

Smith, F. G. "Three Computer Programs for Contouring Map Data." Canadian Journal of Earth Sciences, Vol. 5, No. 2, 1968, pp. 324-327.

Smotkin, H. "La Cartographie Automatique Appliqué a l'Etude du System de Production Industrielle de la Plaine Saxonne." Ann. de Géog., Vol. 78, No. 428, July/August, 1969, pp. 462-470.

Sneeth, P.M.A., & D. F. Merriam. "Quantitative Comparison of Contour Maps." Journal of Geophysical Research, Vol. 71, No. 4, 1966, pp. 1105-1115.

South, N. E., J. W. Sanders, & W. L. Johnson. "Analytical Surfaces for Computer-aided Design." Graphic Science, Vol. 8, No. 4, April, 1966, pp. 14-23.

Spiess, E. "Automatisierter Entwurf von Mengendars-Stellungen." Internat. Yearbook of Cartog., Vol. 8, 1968, pp. 155-161.

Spooner, C. S., Jr., S. W. Dossi, & M. G. Misulia. "Let's Go Over the Hill (Potential Benefits of Profile Scanning the Stereo Model)". Photogrammetric Engineering, Vol. 23, No. 5, December, 1957, pp. 909-920.

Stallings, David L. "A Look at Automated Cartographic Retrieval." Special Libraries Association, Geography and Map Division, Bulletin, No. 64, June, 1966, pp. 5-11.

Stark, M. G., L. Cahn, & R. T. Moore. "Digitizing Pictoral Information with a Precision Optical Scanner." Photogrammetric Engineering, Vol. 30, No. 6, November, 1964, pp. 923-931.

Stein, Arthur. Terrain Mask Angles, Cornell Aeronautical Laboratory, Inc., Buffalo, New York, 1959.

Stine, Gordon E. "Les Systemes d'Automatisation Employées en Cartographie - Leur Evolution - Les Projects d'Avenir." Comité Francais de Cartographie Bull. Fasc. No. 33 Aout-Sept. 1967, pp. 239-247.

Stirling, R. C. "Photographic Instrumentation for Drafting and Plotting with an Automatic Digital Co-ordinatograph." U.S.N.O.O. (United States Naval Oceanographic Office).

Stirling, Robert C., & Deforest D. Choha. "An Automatic Digital System for Preparing Graphics." U. S. Naval Oceanographic Office.

Stoll, Anthony W. "The Automatic Photomapper." Photogrammetric Engineering, Vol. 34, No. 1, 1968, pp. 70-74.

Strees, L. V. "The Development of a Precise Automatic Cartographic Plotter." Nachrichten aus dem Karten und Vermessungswesen, Series V, No. 5, 1963.

Sweeton, R. F. "Animated Graphics for Computer-Aided Decision-Making," in Urban and Regional Information Systems for Social Programs, papers from the Fifth Annual Conference of the Urban and Regional Information Systems Association, New York, September, 1967, pp. 264-272.

Switzer, Paul, C. Michael Mohr, & Richard E. Heitman. Statistical Analyses of Ocean Terrain and Contour Plotting Procedures, Arthur D. Little Inc., Cambridge, April, 1964.

The Centennial Year Symposium on Cartography, Ottawa, February, 1967.
The Ontario Institute of Chartered Cartographers, No. 3, June, 1967.

"SYMAP: A Synagraphic Computer Mapping Program using a line printer--brief descriptions of the Introductory Correspondence Course and program with technical specifications and order form."

"SYMVU: A line plotter-oblique view program which may accept a SYMAP output tape as input--brief description, technical specifications and order form."

Tarrant, John R. Computers in Geography, University of East Anglia, Norwich, January, 1970.

_____. Computers in the Environmental Sciences, Norwich, England, January, 1971.

Taylor, D.R.F. A Computer Atlas of Kenya, Department of Geography, Carleton University, Ottawa, January, 1971.

Taylor, D.R.F., & D. H. Douglas. A Computer Atlas of Ottawa-Hull, 2nd edition, Ottawa, September, 1970.

Taylor, D.R.F. "Computer Mapping - A Tool for the 1970's," La Revue de Geographie de Montreal, 1971, Vol. XXV, No. 4, p. 381-389.

Terjanian, Antoine. "Spatial Referencing and Geocoding Methods: a Discussion Paper." International Expert Meeting on Data Banks for Development, May 24-29, 1971. Saint-Maximin, France.

Theis, Joseph B. "Automation at AMS." Photogrammetric Engineering, Vol. 33, No. 6, June, 1967, pp. 641-648.

Thomas, E. N. "Maps of Residuals from Regression: Their Characteristics and Uses in Geographic Research." Department of Geog. Publication, 2 (Iowa City, State University of Iowa, 1960), 60 pp.

Thompson, Donald R., & P. J. Min. "Computer Graphics - Speed Multicolor Mapmaking." Engineering Graphics, Vol. II, No. 8, August, 1971, pp. 14-15.

Thompson, Donald R. "An IBM Special Cartographic Scanner." IBM Corp., Kingston, New York, ASP-ACSM Convention, Washington, D.C., March 6-10, 1967. IBM Corp., Systems Development Division, Kingston, New York.

Thunberg, A. "Hydrographic Surveying and Data Processing." The Cartographic Journal, Vol. 5, No. 2, December, 1963, pp. 92-106.

Tobler, Waldo R. "Automation and Cartography." Geographical Review, Vol. 49, 1959, pp. 526-534.

_____. "Automation in Preparing Thematic Maps." Cartographic Journal, Vol. 2, No. 1, 1965, pp. 32-38.

_____. "Computer Contouring." Lecture notes - original at Lab. for Computer Graphics, Graduate School of Design, Harvard University.

_____. "An Experiment in the Computer Generalization of Maps." Michigan University, Department of Geography, Report 05824-1-T, December, 1964, 38 pp., 13 refs.

_____. "Geographical Ordering of Information." The Canadian Geographer, Vol. 7, No. 4, 1963, pp. 203-205.

Tobler, Waldo R., Brian J.L. Berry, & Richard L. Morrill. "Geographical Ordering of Information - New Opportunities." The Professional Geographer. Vol. 16, No. 4, July, 1964, pp. 39-44.

Tobler, Waldo R. "Map Projection Research by Digital Computer." Paper presented to the Association of American Geographers, Denver, September, 1963.

_____. Selected Computer Programs, University of Michigan, Ann Arbor, 1970.

_____. (1965). "Computation of the Correspondence of Geographical Patterns." Paper: Proc. Reg. Sci. Assoc. 15, 131-9.

Tomlinson, R. F. (ed.). "Environment Information Systems." I.G.U., September, 1970.

_____. "An Introduction to the Geographic Information System of the Canada Land Inventory." Canada Dept. of Forestry and Rural Development, Ottawa, 1967.

University of California. Graphics Symposium on Computer Graphics, University of California, 1966.

United States Automated Mapping Systems. 4th. U.N. Reg. Cart. Conf. 1964, Asia & Far East, Proceedings, Vol. 2, New York, 1966.

U. S. Army Map Service. "The Pictomap." Corps of Engineers, Dept. of Army, A.M.S. Washington, D.C., 20315.

U. S. Dept. of Commerce. Computer Literature Bibliography 1946 to 1963. U. S. Dept. of Commerce, National Bureau of Standards, Miscellaneous Publication 266, March, 1965.

Urban Atlas, Census Use Study, Bureau of the Census, Suitland, Maryland, December, 1968.

Using Computer Graphics in Community Renewal, Community Renewal Program Guide No. 1, Urban Renewal Administration, Housing and Home Finance Agency, Washington, D.C., January, 1963.

Verzuh, F. "Contour Plot Program." MIT Computing Center, 1958 (Share Program 506).

Vickery, B. C. On Retrieval System Theory, Butterworth and Co., London, 1963.

Voisin, Russell L. "Automation in Private Cartography." Surveying and Mapping, Vol. 28, No. 1, March, 1968, pp. 77-81.

Voskuil, R. J., & O. M. Miller. "Thematic-Map Generalization." The Geographical Review, Vol. 54, January, 1964, pp. 13-19.

Wallner, H. La Nouvelle Banque de Données du Sol or Suede. Office National pour les données foncieres. Stockholm, Suede.

Warntz, William, et. al. (Geography and the properties of surfaces series: paper 44.): "The Sandwich Theorem - a Basic One for Geography." Harvard Papers in Theoretical Geog., 1969.

Warntz, William. "Implicit Map Projections in Computer Print-Outs." Harvard Papers in Theoretical Geography, "Geography and the Properties of Surfaces," Series, Laboratory for Computer Graphics, September 15, 1967, 24 pp.

Weibrecht, O., P. Domschke, H. J. Grunewald, & G. Jehne. "Cartimat: a New Large Automatic Co-ordinatograph." Jena Review, Special Issue, Leipzig, Spring Fair, 1966.

Whitten, E. H. Timothy & Wm. C. Krumbein. "A Surface-fitting Program for Areally-Distributed Data from the Earth Sciences and Remote Sensing." Nasa Contractor Report 318, November, 1965, 146 pp.

Williams, E.P.J. "Automatic Cartography: The Requirements of an Automatic System for Production of Hydrographic Charts and Topographic Maps." Paper J8 presented at the Conference of Commonwealth Survey Officers, 1957.

Williams, W. K. Oakland Planning Information System - User's Manual, Stanford Research Institute for the City of Oakland, California; 701 Project Technical Report No. 1, September, 1967.

Wolf, Jack S. "SYMAP: Computer Graphics for Marketing Management." Journal of Marketing Research, Vol. 6, August, 1969, pp. 357-358.

Wolfendale, P.C.F. "Machine Accuracies in Automatic Cartography." The Cartographic Journal, Vol. 4, No. 1, 1967, pp. 24-28.

Wood, P. A., & K. E. Rosing. "Automated Urban Planning." The Geographical Magazine, Vol. XLII, No. 1, October, 1969, pp. 60-64.

Wood, Walter F. "Statistical Terrain Analysis." Research Trends, Cornell Aeronautical Laboratory, Inc., Summer-Autumn 1964.

Wooldridge, D. E., E. M. Grabbe, & Simon Ramo. Handbook of Automation, Computation, and Control, John Wiley & Sons, Inc., New York, 1959, Vol. II.

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